Proposed Plan

Jones Road Ground Water Plume
Houston, Harris County, Texas

May 19, 2010

EPA Proposes Final Site Remedy

This Proposed Plan presents the United States Environmental Protection Agency's (EPA) and the Texas Commission on Environmental Quality's (TCEQ) preliminary recommendation of **in-situ chemical oxidation** (**ISCO**) for the source area, **bioaugmentation** for the deeper **groundwater** zones, and **groundwater** pumping for hydraulic control ("Alternative 4" as described in more detail below). **Institutional controls** and **groundwater** monitoring are also included in the proposed cleanup.

In this Proposed Plan, EPA describes a proposed final remedy for the Jones Road Ground Water Plume Superfund Site (Site) and provides the reasoning for this preference. In addition, this Proposed Plan includes summaries of other alternatives evaluated for use at this Site. The Proposed Plan is issued by the EPA, the support agency for Site activities, and the TCEQ as the lead agency.

The EPA, in consultation with the state of Texas, will select a remedy for the Site after reviewing and considering all information submitted during the 30-day public comment period. EPA, in consultation with the state of Texas, may modify the proposed alternative or select another remedial action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives presented in this Proposed Plan.

THE PURPOSES OF THIS PROPOSED PLAN

- To present the rationale for the proposed cleanup of contamination at the Jones Road Superfund Site;
- To solicit public review and comment on the proposed action and the information contained in the Administrative Record;
- To provide the history and background information about the Site; and
- To provide details about where you can find more information about the Site.

*Note: Words in **boldface** type are defined in the glossary attached to this document.*

The **Remedial Investigation (RI)**, **Feasibility Study (FS)**, and **Baseline Risk Assessment (BLRA)** should be consulted for more detailed information on these alternatives. The EPA is issuing this Proposed Plan as part of its public participation responsibilities under section 117(a) of the **Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA)** of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Section 300.430(f)(2).

Proposed Plan Public Meeting

You are invited to learn about the remedial action that is proposed for the site. There will be a formal public meeting on the preferred remedial alternative for the site followed by a question and answer session. Representatives from the EPA and the TCEQ will participate. Your attendance and participation is encouraged.

June 3, 2010
7:00 pm
Matzke Elementary School
13102 Jones Road
Houston, TX 77060

This Proposed Plan summarizes information that can be found in greater detail in the **RI**, **FS**, **BLRA**, and other documents contained in the **Administrative Record** file for this Site. The EPA, and state of Texas encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities conducted at the Site.

The **Administrative Record** file, which contains the information on which the selection of the final response action will be based, is available at the following information repositories:

Northwest Branch Harris County Library
11355 Regency Green Drive
Cypress TX 77429
Phone: 281-890-2665

Texas Commission on Environmental Quality Central File Room
12100 Park 35 Circle
Building E, First Floor, Room 103
Austin TX 78753
512-239-2900
512-239-1850 (fax)

ON THE WEB . . .

You can find the proposed plan on EPA's Region 6 web site at:

http://www.epa.gov/earth1r6/6sf/6sf-decisiondocs.htm

You can also find Site information on TCEQ's web site at:

http://www.tceq.state.tx.us/remediation/superfund/jonesroad/index.html

COMMUNITY PARTICIPATION

The public is invited to comment on the **RI**, **FS**, **BLRA**, and Proposed Plan for the Site. The public comment period begins on May 25, 2010 and ends on June 28, 2010. During the public comment period, written comments may be submitted to:

Donn Walters
U.S. EPA (6SF-VO)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Additionally, oral comments will be accepted at a public meeting scheduled for Tuesday, June 3, 2010, beginning at 7:00 p.m., at Matzke Elementary School, 13102 Jones Road, Houston, TX, 77060.

The EPA will respond to all comments received on this Proposed Plan received during the public comment period in a document called a Responsiveness Summary. The Responsiveness Summary will be attached to the Record of Decision (ROD) for this Site and made available to the public in the information repositories. The ROD explains the remedial action selected for use at this Site. The remedy may be different from the preferred alternative identified in this Proposed Plan based on comments, new information, or issues received during the public comment period. Any aspects of the proposed action that are significantly different from the Proposed Plan will be explained in the ROD. The ROD will be signed by the EPA Region 6 Division Director.

Information about the public involvement process and answers to questions about activities at the Site can be obtained from the following individuals:

Gary Baumgarten
U.S. EPA (6SF-RA)
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-6749 or 1.800.533.3508 (toll free)
baumgarten.gary@epa.gov

Donn Walters
U.S. EPA (6SF-VO)
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-6483 or 1.800.533.3508 (toll free)
walters.donn@epa.gov

Media inquiries should be directed to Mr. Dave Bary, EPA Region 6 Press Officer, at (214) 665-2208.

SITE BACKGROUND

The Jones Road Ground Water Plume Site (Site) is a former dry cleaning facility (Bell Dry Cleaners) located in the Cypress Shopping Center at 11600 Jones Road, Houston, Texas. The Site is approximately one-half mile north of the intersection of Jones Road and FM 1960 outside the city limit of Northwest Houston. The area around the Site includes residential, commercial, and light industrial development. Jones Road is the principal north-south corridor through the area, and FM 1960 provides a southwest-northeast corridor. Commercial development is dominant along Jones Road with residential and limited commercial development along the side streets. Soil and **groundwater** are the contaminated media at the Site. Approximately one-half of the homes at the Site have private water supply wells, while the remaining properties are connected to a waterline installed in 2008 as part of an EPA removal action. A Site location map is provided on Figure 1.

Site Operations

The Cypress Shopping Center was constructed in 1984, and it is believed that the Bell facility began dry cleaning operations sometime in 1988 and continued through May 2002 before the dry cleaning operations were shut down. Bell utilized one dry cleaning machine along with conventional laundry equipment at the facility. Perchloroethylene (PCE), which is also known as tetrachloroethylene, was used by Bell as a dry cleaning solvent. As part of the PCE recovery process, water and other contaminants were removed by a water separator and drained out of the machine into a 5-gallon bucket. The liquid was then discharged into a steam-heated pot to evaporate the liquid. The pot was vented through a wall directly to the atmosphere. Based on soil and **groundwater** analyses, this waste stream may have been disposed to the storm sewer located behind the shopping center or the facility's septic system. The soil and **groundwater** analyses indicated that the highest "contaminant mass" in soil and **groundwater** was located in close proximity to the former dry cleaner (especially near the back drain area), and secondary contamination was near the septic field.

Analytical results from a Public Water Supply (PWS) well sampled in December 2000 and May 2001, at the former Finch's Gymnastics (located approximately ½ mile southeast of the Bell facility), found PCE levels to be above EPA's **maximum contaminant level** (**MCL**) of 5 **micrograms per liter (µg/L).** Due to the presence of PCE above the **MCL** in the Finch's well, an investigation was conducted to determine the source of the contamination. Findings from a *Phase I Environmental Site Assessment* conducted in June 2001 and a *Limited Site Assessment* conducted in June 2001, identified the Bell facility as the source of PCE.

The owners of the Bell facility submitted an application to enter into the TCEQ Voluntary Cleanup Program (VCP) on September 10, 2001. The agreement to enter the VCP was signed on October 25, 2001. On March 11, 2002, the TCEQ directed the owner of Bell to locate and sample all water wells within a quarter mile radius of the Bell facility and install an activated carbon filtration system on the well at Finch's Gymnastics. On April 11, 2002, Bell sent a letter to TCEQ and officially withdrew from the VCP citing potential multiple sources of contamination and that the scope of work outlined by TCEQ was financially beyond the capabilities of Bell Dry Cleaners. Following Bell's withdrawal from the VCP, a quarterly sampling and monitoring program was initiated by TCEQ, the lead agency, in February 2002 for private wells located within the vicinity of the Bell facility.

EPA's 2009 Settlement Agreement

In July 2009, the EPA and the settling party, who owned the Bell Dry Cleaners property and building from which the release occurred, signed a "Settlement Agreement". According to the Settlement Agreement, which became final and effective on September 24, 2009, the settling party agreed to continue to provide access to EPA and its representatives, and to implement any future **institutional controls** needed at the Site property that is owned by the settling party. This Settlement Agreement was based on records, which showed that the Bell Dry Cleaners operated the facility until 2002, that the Bell Dry Cleaners was responsible for the release of PCE, and deed records showing that the settling party owned the Bell Dry Cleaners property and building since November 4, 1994.

History of Federal and State Investigations

The Site has undergone numerous investigations by private environmental consulting companies and regulatory agencies and their contractors. Jones Road was proposed to **National Priorities List** (**NPL**) on April 30, 2003 (23094 - 23101 Federal Register / Vol. 68, No. 83). The Site was finalized to the **NPL** on September 29, 2003 (55875 - 55882 Federal Register / Vol. 68, No. 188).

A chronology of previous Site investigations and significant events is summarized below. A more in-depth discussion of past and current investigations can be found in Table 1 of the **RI** Report.

Chronology of Site Investigations

Date	Event
December 20, 2000	The Texas Department of Health (TDH) reported results from the public water system at Finch's Gymnastics USA to contain concentrations of PCE above the EPA **MCL** of 5 **µg/L**. Monthly sampling was conducted in January through May of 2001 by the TDH confirming these initial test results. **Groundwater** contamination is discussed in more detail below.

June 5, 2001	Geo-Tech Environmental, Inc. submitted a *Phase 1 Environmental Site Assessment Report* for the 11600 Jones Road facility for Sterling Bank on behalf of Bell. During inspection of the property, leakage from the dry cleaning machine was noted to be draining into the storm drains behind the Bell facility.
July 9, 2001	A Limited Site Assessment (LSA) was conducted by Geo-Tech Environmental, Inc. for Sterling Bank The LSA included the installation of three soil borings to 25 feet (B1, B2, and B3) and subsequently converting the soil borings to temporary monitor wells (TMW1, TMW2, and TMW3).
February 14, 2002	The Texas Natural Resource Conservation Commission (TNRCC) (now TCEQ) sampled the water well and inside sink at Finch's Gymnastics. The sample results showed PCE levels above the EPA **MCL** of 5 µg/L.
March 13-20, 2002	The TNRCC (now TCEQ) conducted sampling of 43 wells in the Jones Road area.
May 13-20, 2002	A *Focused Site Inspection* was performed at the Site. 52 **groundwater** samples were collected to document the release and migration of contaminants.
October 2002	**Groundwater** sampling event. TCEQ installed granular activated carbon (GAC) filtration systems on 21 water wells where PCE concentrations were detected above the **MCL**.
August - September 2003	TCEQ began field activities for the **remedial investigation**. Thirty-six cone penetrometer test (CPT) borings were completed and three permanent monitor wells (MW-7, MW-8, and MW-9) were installed. **Groundwater** and soil samples were collected.
August 2004	Shaw completed ten CPT borings for TCEQ near the 10902 Tower Oaks property and 10819 Barely Lane, which was an area suspected to be a separate source of **groundwater** contamination (other than 11600 Jones Road). The borings were completed to a depth of approximately 70 feet bgs.
July, August, and November 2005	Shaw installed nine Chicot **Aquifer** monitor wells (MW-10 – MW16 and MW18 – MW19) for TCEQ. One monitor well (MW-17) was installed into the upper portion of the Evangeline **Aquifer**. The deep monitor wells were installed to provide monitoring points around the perimeter of the study area (excluding monitor well MW-13, which was installed near the study area) where **groundwater** elevation data and samples could be collected.
August 2006	Shaw performed a bench-scale treatability study on soil and **groundwater** samples for TCEQ. The study included applications of **ISCO**, biostimulation/ **bioaugmentation**, and abiotic treatment using zero-valent iron.
February 2008	Shaw conducted a vapor intrusion study at the Bell facility for TCEQ. Results are documented in the May 6, 2008 *Vapor Intrusion Study* report. The purpose of the study was to determine if completed pathway(s) exist for intrusion of vapors from the Bell facility to workers in the Cypress Shopping Center, and if indoor vapors could pose an unacceptable risk of chronic health effects due to long-term exposure.

History of CERCLA Removal Actions

The EPA conducted a time-critical removal action that included the installation of a water line and connections to homes and businesses at the Site. The removal action involved the design and installation of a water main system. Construction of the water line began in January 2008 and was completed in November 2008. A total of 144 service connections were completed. The waterline is serviced by the White Oak Bend Municipal Utility District.

SITE CHARACTERISTICS

Due to the lack of zoning ordinances, Houston and Harris County have a diverse mixture of urban commercial and residential land use. Land use near the Site is a mixture of commercial and light industrial properties (generally focused along the north/south Jones Road corridor) and residential properties primarily located west of Jones Road.

WHAT ARE THE CHEMICALS OF CONCERN?

The EPA and the TCEQ identified PCE, TCE, and VC as the chemicals of concern that pose the greatest potential risk to human health at the Site.

- PCE: This chemical was used in the dry cleaning process at the Site. Results of animal studies, conducted with amounts much higher than those that most people are exposed to, show that tetrachloroethylene can cause liver and kidney damage. Irritation may result from repeated or extended skin contact. The health effects of breathing in air or drinking water with low levels of tetrachloroethylene are not known. The EPA has determined that PCE is a probable human carcinogen.

- TCE: This chemical is a degradation product of PCE. Drinking TCE for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear. Skin contact with TCE for short periods may cause skin rashes. The EPA has determined that TCE is a probable human carcinogen.

- VC: This chemical is a degradation product of TCE. Some people who are repeatedly exposed to high levels of VC have developed changes in liver structure, nerve damage, and immune reactions. The lowest levels that produce these effects in people are not known. The effects of drinking high levels of VC are unknown. When in contact with the skin, it can cause numbness, redness, and blisters. The EPA has determined that VC is a known human carcinogen.

The immediate area around the Site is transitioning from low density to higher density as the City of Houston grows larger bringing development to outlying areas. Comparison of the 1995 Quadrangle Map for the area to current aerial photos indicates that additional commercial and residential development is replacing open spaces. Around the area of the Site, athletic fields have been replaced by apartments, and a mobile home park is being replaced with high density individual homes. Development of residential and commercial areas is expected in the future.

The Site is located along the border between Harris County annexed and non-annexed areas of the city of Houston with limited water and sewer infrastructure currently in place. A majority of the private homes are therefore on private well water supply and septic systems. The private water wells range in depth from 112 feet bgs to 560 feet bgs. Local area municipal utility districts and water supply districts are connecting water and sewer systems as new homes are built in the area, which is replacing the use of individual water wells and/or septic systems. A Site area map with the location of private wells is shown in Figure 2.

Soil Contamination

Contaminants at the former Bell facility were removed from the dry cleaning machine by a water separator and drained out of the machine on a continuous basis into a 5-gallon plastic bucket. This waste material may have been disposed to the facility's septic system or to the storm sewer located immediately behind the shopping center.

During the period from October 22 thorough 29, 2003, twenty-one soil borings were completed to a maximum depth of thirty-five feet below ground surface (bgs) using direct-push technology (DPT) drilling methods. The purpose of the investigation was to identify potential PCE discharge points to the shallow soil, including storm water drainage areas, areas associated with the septic system (field and tank), and the foundation of the building. During the week of July 17, 2006, a second DPT investigation was conducted at the Bell facility to evaluate contamination down to depths of approximately 50 feet bgs.

Results of soil laboratory analysis indicted PCE, trichloroethylene (TCE), cis-1,2-dichloroethylene (DCE), and vinyl chloride (VC) impact to soil in nine of 21 DPT borings (GP-3, GP-4, GP-5, GP-6, GP-7, GP-8, GP-13, GP-16, and GP-20) with soil samples collected from 1 to 35 feet bgs. The sample results concluded that PCE is the most prevalent contaminant in Site soils, with the highest concentrations detected in soil located behind the Bell facility and representing the suspected primary discharge area. The highest PCE concentration in soil was 260 milligrams per kilogram (mg/kg) (or parts per million [ppm]). The area of soil contamination at the source area is approximately 26,000 square feet (ft^2), and extends to a depth of approximately 20 feet bgs. The estimated volume of contaminated soils is approximately 33,000 cubic yards.

Results of extensive soil and **groundwater** sampling around the Bell facility indicate that the suspected primary discharge area of PCE was likely located immediately behind the Bell facility and around the sub-slab floor drain.

Soil in the source area has been determined to be a probable pathway for PCE migration to **groundwater**. Soil and **groundwater** samples, especially collected immediately behind the Bell facility, suggest that PCE has traveled through the soil and into all of the underlying contaminated **groundwater** bearing units.

Site Hydrogeology

The two major **aquifers** identified at the Jones Road Site are the Chicot **Aquifer** and the Evangeline **Aquifer**. The Chicot **Aquifer** is the shallowest **aquifer** and for the purposes of the **RI**, the top of the

Chicot **Aquifer** is at ground surface. The Evangeline **Aquifer** underlies the Chicot **Aquifer**, beginning at approximately 400 feet bgs at the Jones Road site, and is mainly tapped by local municipal utility districts (MUD). At the site, five major water bearing units (WBUs) have been identified within the Chicot **Aquifer**, and at least seven major WBUs have been identified within the Evangeline **Aquifer** based strictly on well screening depths, but not on geology, as described in the next section. The shallowest WBU identified at the Site occurred at a depth of approximately 20 feet to 35 feet bgs within the Chicot **Aquifer**. Historical **groundwater** elevations and flow directions in this shallow source area WBU have been highly erratic (highly variable in elevation), possibly due to discontinuous water-bearing lenses within the shallow source area WBU under perched **aquifer** conditions. An illustration of the Conceptual Site Model for the Site is shown in Figure 3.

Hydraulic conductivity describes the ease with which water can move through pore spaces or fractures in soil or rock. Hydraulic conductivity values in Harris County range from 14 to 35 feet per day (ft/day) for the Chicot **Aquifer** and 20 to 100 ft/day for the Evangeline **Aquifer**. **Groundwater** in these **aquifers** generally flows from the northwest to the southeast perpendicular to the Gulf of Mexico coastline, but is locally influenced by large municipal water well pumping. Most of the water wells at the Jones Road Site are screened in the Chicot **Aquifer**, with total depths less than 400 feet bgs.

Groundwater Contamination

Soil in the source area has been determined to be a probable pathway for PCE migration to **groundwater**. Soil and **groundwater** samples, especially collected immediately behind the Bell facility, suggest that PCE has traveled through the soil and into the underlying **groundwater** bearing units. Because the density of PCE is greater than that of water, it tends to move downward to the bottom of any sandy zone and pool on top of less permeable silt or clay layers. Density differences of ~1% influence fluid movement in the subsurface, and the density of PCE is 62% greater than that of water (1.62 compared to 1.00). The relatively high density of PCE means that it may penetrate the water table and flow vertically downward, directed by paths of least capillary resistance (possibly against the lateral direction of **groundwater** flow). PCE penetrates clay by moving through fractures, and where clay layers are discontinuous, PCE will simply flow over the edges of discontinuous clay lenses and continue downward through more permeable material.

At the Site, the complex subsurface geology precludes identification of distinct and continuous WBUs within the Chicot and Evangeline **aquifers**. As a proxy for distinct WBUs, the wells have been divided into various categories by screened depth to evaluate the nature and extent of PCE contamination in the **groundwater**. The monitor wells and water wells have been divided into five groups, less than 200 feet bgs, 200 to 230 feet bgs, 231 to 260 feet bgs, 261 to 300 feet bgs, and 301 to 540 feet bgs. There are 49 wells (23 sampled) in the less than 200 feet group, 158 wells (65 sampled) in the 200 to 230 group, 94 wells (40 sampled) in the 231 to 260 group, 60 wells (19 sample) in the 261 to 300 group, and 45 wells (8 sampled) in the 301 to 540 group. Well construction information, based on State of Texas well reports, was determined to be available for approximately 30 to 40% of the water wells in the area. However, there were also 193 sampled wells for which the screened interval and total depth are unknown.

The distribution of PCE in nearby commercial and residential water wells occurs primarily west, southwest, and southeast of the source area, but water wells located north and northwest of the source area are also impacted. Movement of the plume north and far west of the source area would not be expected under static **groundwater** flow conditions and in uniform geologic formations. However, **groundwater** flow conditions are likely not static; flow may be influenced by seasonal pumping of numerous private and commercial water wells surrounding the source area. Historically, increased PCE concentrations have been observed during February and May sampling events, and may be related to surface drought conditions that promote increased water demand (pumping from water wells) to irrigate lawns in the area. Also, the subsurface geology is not uniform; the geology is comprised of complex deposits, such as ancient river channels and over-bank deposits that may provide lateral pathways to **aquifers** north and northwest of the source area. The most recent estimate of the average **groundwater** plume migration rate, based on information available through May 2008, has been calculated to be 90 feet per year, based on a plume length of 1800 feet from the source area divided by 20 years, which is the approximate time since the PCE release began.

Harris County has designated a limited area around the Jones Road Site as an area of "No New Wells" in a contaminated plume area designated by the EPA and TCEQ. In addition, the Texas Department of Licensing and Regulation (TDLR) has designated a restricted water well drilling area around the Site. Any new well installed in the restricted area must be drilled to a greater depth, and specific construction methods must be used to prevent cross-contamination. The Harris County and TDLR areas do not overlap exactly, but both are large enough to entirely contain the **groundwater** plume.

Shallow Groundwater (Source Area)

For the purpose of the Proposed Plan, shallow **groundwater** in the source area occurs in the Chicot **Aquifer** at a depth of approximately 20 feet to 35 feet bgs. Any WBU within one-half mile of an existing well used to supply drinking water to a public water system, which can contribute **chemicals of concern** (**COCs**) to the **groundwater** production zone of such public water supply well is considered Class 1 **groundwater**. Because shallow wells at the Site are in hydraulic communication with much deeper WBUs, and the same contaminants are present in both the shallow source area WBU and the deep drinking water **aquifers**, the shallow source area **groundwater** would most likely be Class 1.

In the shallow **groundwater**-bearing unit (less than 35 feet bgs) of the source area, the distribution of PCE in **groundwater** indicates that the **groundwater** flow direction is southwest. February 2008 mapping of PCE in the shallow source area monitor wells, which were less than 50 feet bgs deep, indicates that the PCE plume in the shallow zone has moved farther downgradient from the source area since it was investigated in 2003. The highest PCE concentrations are now detected in monitor well MW-6 near the southwest corner of the Cypress Shopping Center facility. The concentration of PCE in monitor well MW-6 was 6,000 **µg/L** in August 2003, but increased to a concentration of 167,000 **µg/L** in February 2008, and then dropped to 7480 **µg/L** in May 2008. A similar increase in PCE concentrations has occurred in MW-1, which was installed immediately downgradient of the suspected source area. The concentration of PCE increased from 3,900 **µg/L** in August 2003 to 27,900 **µg/L** in February 2008. The increase in PCE in monitor well MW-1 could be an indication that PCE is still being released from soils in the suspected source area. The areal extent of shallow **groundwater** contamination is shown on Figure 4. The area of contaminated **groundwater** at the source area is approximately 60,000 ft^2, with an average thickness of 10 feet, and an assumed value for porosity of 0.25. Based on these assumptions, the volume of contaminated **groundwater** in the source area is approximately 1.1 million gallons.

Deeper Groundwater (Chicot and Evangeline Aquifer)

The deeper **groundwater** units at the Site are defined as the WBUs below the shallow WBU. The top of the deeper WBUs occurs at a depth of 60 feet bgs. The deeper WBUs used by private and public water supply wells at the Jones Road Site are classified as Class 1 **groundwater**. The distribution of PCE in nearby commercial and residential water wells occurs primarily west, southwest, and southeast of the source area, but water wells located north and northwest of the source area are also impacted. PCE concentrations as high as 590 **µg/L** have been detected in the deep **groundwater**, but recent maximum concentrations have been less than 200 **µg/L**. In **groundwater** from wells reported to be less than 200 feet bgs, PCE has been found above the **MCL** in wells at seven properties. **Groundwater** contamination between 200 and 230 feet bgs, is defined by samples collected from 65 water wells, which are mostly to the west of the Bell facility, and some to the southeast. In **groundwater** 200 to 230 feet bgs, PCE has been found above the **MCL** at nine locations. Samples collected from 2 monitor wells and 38 water wells mostly to the west of the Bell facility, and some to the southeast, were used to define the extent of **groundwater** contamination at depths from 231-260 feet bgs. At depths from 231-260 bgs, PCE was found above the **MCL** at seven locations. **Groundwater** contamination between 261 and 300 feet bgs, is defined by samples collected from seven monitor wells and 12 water wells mostly to the west of the Bell facility, and some to the southeast. In **groundwater** from 261 to 300 feet bgs, PCE has not been found above the **MCL**. At the Jones Road Site, PCE was not detected above **MCL**s in water samples collected from water wells drilled deeper than 300 feet bgs. For **groundwater** between 301 and 535 feet bgs, the **groundwater** samples consist of multiple samples from one monitor well and seven water wells mostly to the west of the Bell facility, and some to the southeast. The areal extent of **groundwater** contamination in the deeper zone is shown on Figure 5.

The deep drinking water aquifers impacted by dissolved-phase PCE extend from 50 feet below ground surface (shallow boundary definition) to approximately 260 feet below ground surface. Figure 5 shows the overlapping extent of deep **groundwater** plumes. The area of contaminated **groundwater** in the deeper **groundwater** is approximately 3,384,279 ft^2 (approximately 77 acres), with an average thickness of 127 feet, and an assumed value for porosity of 0.25. These assumptions give a source area contaminated **groundwater** volume of 804 million gallons. This is probably a high end estimate because the **groundwater** plume area at individual depth intervals is smaller than the overlapping plume extent.

Indoor Air

Vapor intrusion is the migration of volatile chemicals from the subsurface into overlying buildings. A vapor intrusion study was performed at the former Bell facility in February 2008, *Vapor Intrusion Study* (Shaw, May 6, 2008) to determine if a completed pathway(s) exists for intrusion of vapors to workers in the Cypress Shopping Center (from the Bell facility), and if indoor vapors could pose an unacceptable risk of chronic health effects due to long term exposure.

During the *Vapor Intrusion Study*, two indoor ambient air samples and two sub-slab air samples were collected inside the former Bell facility, for analysis of volatile organic compounds (VOCs) using USEPA Method TO-15. Results of laboratory analysis were compared to the Tier II Table from the OSWER *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from* ***Groundwater*** *and Soils, November 2002*. PCE and TCE exhibited higher concentrations than the OSWER Tier II target concentrations for the two ambient air samples. In one ambient air sample, the PCE and TCE concentrations were 14 micrograms per cubic meter ($\mu g/m^3$) and 1.8 $\mu g/m^3$, respectively. For the other ambient air sample, the PCE and TCE concentrations were 9.5 µg/m^3 and 1.7 µg/m^3, respectively. Fourteen other chemicals were detected but did not exceed the OSWER Tier II target concentrations, and were suspected to be related to household compounds (and other chemicals stored on-site) that would be expected to be found at low concentrations in ambient indoor air. Eight chemicals were detected in the sub-slab samples. PCE and TCE concentrations were 47,300 µg/m^3 and 9,080 µg/m^3 in one sub-slab sample, and 59,700 µg/m^3 and 1,930 µg/m^3 in another sub-slab sample, respectively. The sub-slab samples were evaluated by estimating attenuation factors relative to soil or **groundwater** concentrations to indoor air concentrations. For indoor air, the *Vapor Intrusion Study* concluded that a complete pathway for vapor intrusion exists, but very little vapor is migrating from the sub-slab soil into indoor air (the slab is an effective barrier to limit vapor intrusion). In the future, should the site conditions change due to re-development or some other change in the slab condition, then the conclusion that very little vapor is migrating to the indoor air should be re-evaluated.

Because the indoor air samples were collected in February, and may not be representative of the indoor air concentrations during the hotter summer months (due to seasonal variability), additional indoor sampling will be performed during the summer as a part of the Remedial Design to confirm the initial results.

Surface Water and Sediment Sampling

Because there is no surface water located within the vicinity of the Site, this potential risk scenario does not exist, and no surface water or sediment investigations were performed at the Site. The nearest surface water is White Oak Bayou (approximately 3500 feet to the south) and also Cypress Creek (approximately 1 mile to the northwest of the Site). No surface water or sediment investigations were performed at the Site.

Source Materials and Principal Threat Wastes

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a Site wherever practicable. The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, non-aqueous Phase Liquids (NAPL) in ground water may be viewed as source material. **Principal threat wastes** are those materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. Non-**principal threat wastes** are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure.

The impacted soil associated with the former dry cleaner is regarded as a **principal threat waste** because of its potential to impact additional **groundwater**. The limited extent of PCE impact to soil indicates the main pathway for PCE transport was likely vertical in the form of dense non-aqueous phase liquid (DNAPL). However, although high concentrations of PCE have been detected in soil, no DNAPL was observed during Site investigations. Contamination that exists in the dissolved-phase **groundwater** plume at the Site is considered low-level threat waste.

SCOPE AND ROLE OF RESPONSE ACTION

There is only one planned **operable unit** for the Site and the actions proposed in this plan are intended to fully address the threats to human health and the environment posed by the conditions at this Site. The purposes of this response action are to implement a site-wide strategy for restoring the Chicot **Aquifer** to its beneficial use, preventing current and future exposure to the **groundwater** impacted by past Site operations, and preventing/minimizing the potential for **groundwater** contamination to migrate laterally or vertically to wells in the surrounding area. In addition, the response will reduce or eliminate the potential DNAPL as a **principal threat waste.**

SUMMARY OF SITE RISKS

As part of the **RI/FS**, a baseline human health risk assessment was conducted to determine the current and future effects of contaminants on human health. A Superfund baseline human health risk assessment estimates the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate the baseline risk at a Superfund site, a four-step process is performed as follows:

- Step 1: Analyze Contamination;
- Step 2: Estimate Exposure;
- Step 3: Assess Potential Health Dangers;
- Step 4: Characterize Site Risk

In Step 1, the concentrations of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable) are evaluated. Comparisons between site-specific concentrations and concentrations reported in past studies allow a determination of which contaminants are most likely to pose the greatest threat to human health. In Step 2, the risk assessment considers the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, a "**reasonable maximum exposure**" (**RME**) scenario is calculated, which portrays the highest level of human exposure that could reasonably be expected to occur. In Step 3, the risk assessment uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. The risk assessment considers two types of risk: cancer risk and non-cancer risk. The likelihood of any kind of cancer resulting from a Superfund site is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance." In other words, for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected to from all other causes. For non-cancer health effects, EPA calculates a "**hazard index**." The key concept here is that a "threshold level" (measured usually as a **hazard index** of less than 1) exists below which non-cancer health effects are no longer predicted. In Step 4, the risk assessment determines whether site risks are great enough to cause health problems for people at or near the Superfund site.

A **Baseline Risk Assessment (BLRA**) for the Site was completed in August 2008. The **BLRA** evaluated the potential current and future risks to human health and the environment if no cleanup actions are conducted at the Site. The risk assessments are used as a basis for deciding whether or not any action is needed to control potential current or future risks to human health and the environment.

Human Health Risks

At chlorinated solvent sites, PCE and its degradation products are commonly identified as **COCs**, and their **MCL**s are selected as cleanup levels in the Record of Decision. The basis for this approach is OSWER Directive 9355.0-30, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (USEPA, 1991a), which states that chemical-specific standards that define acceptable risk levels (e.g., **MCL**s) may be used to determine whether an exposure is associated with an unacceptable risk to human health or the environment and whether remedial action is warranted.

Land and Ground Water Use Assumptions

The area around the Site is characterized by residential, commercial, and light industrial development. Jones Road is the principal north-south corridor through the area, and FM 1960 (approximately one-half mile to the south) provides a southwest-northeast corridor. Commercial development is dominant along Jones Road with residential and limited commercial development along the side streets. Although there is a lack of zoning in Houston and Harris County, the land use near the Site is expected to maintain the current mixture of commercial and light industrial properties (generally focused along the north/south Jones Road corridor).

The Chicot and Evangeline **Aquifers** are a source of drinking water in the area. Most homes in the study area have private water supply wells, and some homes share a single well with others. Septic systems are used in the absence of a publicly-owned treatment works (POTW). A public water supply line was installed in 2008 as an alternate water source to replace the private water wells that withdraw or potentially withdraw **groundwater** contaminated with PCE. Connection to the water line was voluntary and approximately 51% of residences and business are now connected to the water line. However, about 49% of the well owners declined to participate in the water line project and continue to use their private water wells.

The property on which the former Bell facility was located consists of a rectangular parcel of land of approximately 2.1 acres in size improved with a one-story building (Cypress Shopping Center) of about 30,870 square feet containing approximately 10 tenant spaces.

Potentially Exposed Populations and Exposure Pathways

An exposure assessment was conducted as part of the risk assessments. The exposure assessment consists of characterizing the potentially exposed receptors (i.e, worker, visitor, etc.), identifying exposure pathways, and quantifying exposure. A complete exposure pathway includes the following: (1) a source and means of contaminant release; (2) a transport medium (e.g., air, ground water, etc.); (3) a point of contact with the medium (i.e., receptor); and (4) an intake route (e.g., inhalation, ingestion, etc.).

Following consideration of potential exposure pathways, two exposure pathways were determined to be complete and were evaluated as part of the risk assessment. Residents at locations within the extent of the **groundwater** plume, who did not connect to the water line, are expected to be exposed to **COCs** in

groundwater through the ingestion pathway. Inhalation exposure of residents and indoor workers to VOC vapors were also evaluated in the **BLRA**.

Chemicals of Concern

The regulatory screen only applies to contaminants in **groundwater**. Once the chemicals of potential concern (COPCs) for **groundwater** have been determined via the risk-based screen, those chemicals were compared to their **MCL**s. **MCL**s are promulgated by the Safe Drinking Water Act (SDWA) and are commonly used for the remediation of **groundwater** at CERCLA sites. **MCL**s are regarded in Superfund as **applicable or relevant and appropriate requirements (ARARs)**, and EPA is authorized to implement a remedial action when those **ARARs** are exceeded. OSWER Directive 9355.0-30, *Role of the **Baseline Risk Assessment** in Superfund Remedy Selection Decisions*, clarifies the role of the **baseline risk assessment** in developing Superfund remedial alternatives and supporting risk management decisions. It also includes guidance on the use of **MCL**s in this process. PCE, TCE, and VC were identified as **COCs** for the risk assessment for **groundwater**.

Concentrations of vapor measured indoors at the Site were compared to draft USEPA (2002a) air screening levels. Site-related contaminants (PCE, TCE, and DCE) were detected, with PCE and TCE measured above draft USEPA screening levels in both indoor air samples. The VOCs detected in sub-slab soil vapor were PCE, TCE, and DCE, the same Site-related VOCs detected in indoor air. PCE and TCE were detected in both sub-slab soil vapor samples at concentrations well above draft EPA screening values for sub-slab soil vapor designed to be protective of indoor air. PCE and TCE are considered **COCs** based on the comparison of the indoor air sampling results to the screening values.

Estimated Cancer and Non-cancer Risks

The final step of the risk assessment process is risk characterization. Risk characterization combines the exposure assessment with the toxicity assessment. The toxicity assessment evaluates the relationship between a dose of a chemical and the predicted occurrence of an adverse health effect. In the risk assessment, toxic effects are separated into two categories: cancer effects and noncancer effects. For noncancer effects, the risk is expressed as a **hazard index (HI).** An **HI** greater than 1 indicates a potential for adverse effects. Potential cancer effects are characterized in terms of the excess chance of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. An excess cancer risk of 1×10^{-6} (one in 1,000,000) is used by EPA as a starting point for determining remediation goals. Carcinogens at concentrations representing an excess cancer risk range above 1×10^{-4} (one in 10,000) to 1×10^{-6} (one in 1,000,000) are generally considered unacceptable and warrants remedial action. The hazards and/or cancer risk presented in the risk characterization should be viewed along with uncertainties that exist in the data, assumptions, methods and endpoints that are being studied.

Estimated risk from ingestion of **groundwater** was calculated for the adult and child hypothetical resident, and the adult worker. Carcinogenic risk from exposure to **groundwater** is presented as a range, due to the use of two slope factors for vinyl chloride to characterize exposures during adulthood (adult risk) and continuous exposures from birth based on the ages at which exposure would theoretically begin. Estimated cancer risk for the adult resident hypothetically exposed to **groundwater** (that is not from a municipal supplier) ranged from 3.9×10^{-5} to 4.8×10^{-5}, which reflects the contributions of two risk estimates for exposure to vinyl chloride. The estimated noncancer hazard from ingestion of **groundwater** was calculated for the adult and child resident. The estimated **hazard index**

(**HI**) for the adult resident hypothetically exposed to **groundwater** (that is not from a municipal supplier) is 0.071. The estimated **HI** for the child resident is 0.18. Therefore, the measured indoor concentrations of PCE and the degradation products in indoor air did not pose an unacceptable human health risk.

Estimated risk from inhalation of indoor air was calculated for the adult and child resident, and the adult worker. Estimated cancer risk for the hypothetical resident, based on the indoor air sampling results from the *Vapor Intrusion Study*, was 4.5×10^{-5}. Estimated cancer risk for the hypothetical indoor worker was 1.4×10^{-5}. The estimated noncancer **HI** for the hypothetical adult resident was 0.08. For the child resident, an inhalation **HI** was estimated as 0.081. The estimated noncancer hazard for the hypothetical indoor worker was 0.037.

Because the indoor risks were determined based on air samples collected in February, which may not be representative of the indoor air concentrations during the hotter summer months, additional indoor sampling will be performed during the summer as a part of the Remedial Design to confirm the initial results. The indoor air risks are based on the sample results from the *Vapor Intrusion Study*, which concluded that very little vapor is migrating from the sub-slab soil into indoor air (the slab is an effective barrier to limit vapor intrusion). In the future, should the site conditions change due to re-development or some other change in the slab condition, then the conclusion that very little vapor is migrating to the indoor air should be re-evaluated.

Ecological Risks

The objective of the ecological assessment is to evaluate potential effects on ecological receptors resulting from the chemicals identified in environmental media at the Jones Road Site. The ecological evaluation used the *Tier 1 - Ecological Exclusion Criteria Checklist* described in the Texas Risk Reduction Program (TRRP) (30 TAC §350). This exclusion criteria checklist was used to determine whether or not further ecological evaluation is necessary at the Site. Exclusion criteria refer to those conditions at a property, which preclude the need for a formal ecological risk assessment because there are incomplete or insignificant ecological exposure pathways. Residential development has been active in the area of the Site since the 1960s effectively eliminating natural wildlife habitat from the area. Exposure to burrowing animals is also unlikely considering the highly urbanized area and unlikely ecological habitat. The evaluation indicated that no further action is necessary to protect ecological receptors at the Site due to the lack of habitat.

BASIS FOR TAKING ACTION

Comment [K1]: Please include this section, or the following paragraph. See guidance highlight 3-2.

The basis for taking action at the Site is the exceedance of drinking water standards (i.e., the **MCL**s) in ground water that is a current or potential source of drinking water. It is the TCEQ's and EPA's current judgment that the Preferred Alternatives identified in this Proposed Plan, or any of the other active measures considered in the Proposed Plan, are necessary to protect public health or welfare of the environment from actual or threatened releases of PCE, TCE, and VC, which are hazardous substances, into the environment.

Comment [K2]: This should be specific to your contaminants. I am not sure if they are defined as hazardous substances, or are defined as pollutants or contaminants by the NCP.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (**RAOs**) are established to support the evaluation of remedial alternatives for areas with the potential for unacceptable risk as identified in the risk assessment. The **RAOs** are established by specifying contaminants, media of concern, potential exposure pathways, and remediation goals.

The Jones Road Site consists of the source area near the former Bell Dry Cleaner facility, where shallow soil and **groundwater** were impacted, and the deeper **groundwater** plume underlying the Site.

The expectations for contaminated ground water in the NCP and the Site-specific conditions can be used to define the **RAOs** that the selected remedy should accomplish at the Site. Considering expectations for contaminated groundwater in the NCP and the Site conditions, the **RAOs** that the selected remedy should accomplish for the Jones Road Site include the following:

Source Area

- Prevent future human exposure to contaminated ground water at unacceptable risk levels;
- Prevent or minimize further migration of contaminants from source materials to **groundwater** (source control);
- Prevent or minimize further migration of the contaminant plume (plume containment); and
- Return ground waters to its expected beneficial uses wherever practicable (**aquifer** restoration).

Deep Groundwater Plume

- Prevent future human exposure to contaminated ground water at unacceptable risk levels;
- Prevent or minimize further migration of the contaminant plume (plume containment); and
- Return ground waters to its expected beneficial uses wherever practicable (**aquifer** restoration).

The following preliminary remedial goals provide numerical criteria that can be used to measure the progress in meeting in the **remedial action objectives** for the cleanup:

Groundwater

PCE and daughter product concentrations in **groundwater** that exceed federal **MCL**s pose a risk to human health if consumed. The **MCL** values, which are established to protect the public against consumption of drinking water contaminants that present a risk to human health, constitute the allowable exposure level for these contaminants in **groundwater**. Remediation goals for **groundwater** are set equal to the **MCL**s.

Perchloroethylene	5	**µg/L**
Trichloroethylene	5	**µg/L**
cis-1,2-Dichloroethylene	70	**µg/L**
trans-1,2-Dichloroethylene	100	**µg/L**
Vinyl Chloride	2	**µg/L**

The RAO for preventing or minimizing further migration of contaminants from source materials (source control) to **groundwater** will also be set at the remediation goals for groundwater so that achievement of the MCLs will be deemed to effectively meet the RAO for source control.

SUMMARY OF REMEDIAL ACTION ALTERNATIVES

The remedial alternatives described in the Proposed Plan were developed to address the **remedial action objectives** and attain the preliminary remedial goals identified for the Site. The alternatives were developed to address the source control, plume containment, and **aquifer** restoration objectives. The NCP requires development of a range of alternatives that address principal threats posed by the Site, but vary in the degree of treatment used and the quantities and characteristics of untreated wastes that must be managed. Alternatives were developed to address the **RAOs** within an acceptable time frame. To the maximum extent feasible, the alternatives minimize the need for long-term management. The no action alternative has been retained as a baseline for comparison, as required by the NCP.

The alternatives (with the exception of Alternative-1) include the following common remedial components:

Institutional Controls (ICs): ICs are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's expectation that treatment or engineering controls will be used to address **principal threat wastes** and that **groundwater** will be restored to its beneficial use whenever practicable, **ICs** play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site. For instance, zoning restrictions prevent site land uses, like residential uses, that are not consistent with the level of cleanup.

ICs are used when contamination is first discovered, when remedies are ongoing, and when residual contamination remains on-site at a level that does not allow for unrestricted use and unlimited exposure after cleanup. The NCP emphasizes that **ICs** are meant to supplement engineering controls. In order to prevent people from drilling a domestic well into the Jones Road Site contaminated **groundwater** plume, EPA will utilize an **IC** approved by Harris County. The Harris County Commissioners Court adopted a rule entitled *Rules of Harris County For The Placement of Waterwells* on May 16, 2006. The rule prevents the drilling of a domestic well into a contaminated **groundwater** plume or **aquifer**. A contaminated **groundwater** plume or **aquifer** means any **aquifer** or portion of **aquifer** that has been confirmed as contaminated by the TCEQ or EPA. Harris County designated an area around the Jones Road Site, shown on Figure 5, as an area of "no new wells" in a contaminated plume area. Harris County implements this rule by requiring an applicant to submit a request for a water well; the proposed location is then checked to determine whether it is located in a "no new well" area. Although Harris County is responsible for enforcing this rule; the effectiveness of the above **IC** will be evaluated as a part of the **five-year review** process. If additional **ICs** are determined to be appropriate, the placement of additional **ICs** may be implemented prior to the end of the 10-year *long term response action* period (LTRA). The LTRA is defined as a fund-financed remedial action involving treatment or other measures to restore ground-or surface-water quality for a period of up to ten years after the remedy becomes operational and functional.

Because the preferred remedial action is expected to achieve restoration of the aquifer as a drinking water source, the number of properties impacted by the groundwater contamination is expected to decline over a 10-year period. The EPA will implement a system of short-term **ICs** during the 10-year LTRA period to provide notice to new landowners and reminders to existing landowners of the presence of **COCs** above remedial goals in the groundwater beneath the property. These short-term **ICs** will consist of overlapping controls, which may include, but are not limited to, county health notices, site inspections, or semi-annual notices to property owners/renters.

Prior to the completion of the LTRA period, the EPA will coordinate with the TCEQ to identify which properties may require **ICs** should ground water contamination, exceeding the remedial goals, remain after the 10-year LTRA period. EPA will provide the required property information to the TCEQ for the placement of **ICs** and work with the TCEQ to request each affected property owner voluntarily agree to record a restrictive covenant to serve as the **IC**. If the property owner does not agree to the restrictive covenant, the TCEQ shall record a deed notice to serve as the **IC**.

The **IC** can consist of either a restrictive covenant or a deed notice.

- Restrictive Covenant. An instrument filed in the real property records of the county where the affected property is located, which ensures that the restrictions will be legally enforceable by the TCEQ when the person owning the property is the innocent landowner. The covenant can only be filed by the property owner and is binding on current and future owners and lessees even if they are innocent owners or operators.

- Deed Notice. An instrument filed in the real property records of the county where the affected property is located and is intended to provide notice regarding the conditions of the affected property.

The **ICs** will be maintained until the concentration of contaminants in the groundwater are below levels that allow for unrestricted use and unlimited exposure, i.e., the concentrations of contaminants in the groundwater are below the established remedial goals.

Groundwater Monitoring: One of the performance measures for evaluation of the remedial alternatives is the collection of contaminant concentration data from the **groundwater** monitoring network. **Groundwater** monitoring would be quarterly for the first two years, and semiannually for years 3 through 5. This would be reduced to annual sampling if data appropriately demonstrates the effectiveness of remedy performance and shows enough stability to permit the reduction.

Indoor Air Sampling: Because the indoor air samples were collected in February, and may not be representative of the indoor air concentrations during the hotter summer months, additional indoor sampling will be performed during the summer as a part of the Remedial Design to confirm the initial results.

ARARs: The primary chemical-specific ARARs are the Safe Drinking Water Act (SDWA) because the deep groundwater has been used for drinking water, and the MCLs because they are allowable levels for contaminants in drinking water. For the alternatives including a pump and treat component, the potentially applicable chemical-specific ARARs are the Texas Surface Water Quality Standards, which would apply to any surface water discharges, or the City of Houston publicly-owned treatment works (POTW) pretreatment requirements, which would apply to any discharges to a POTW. For re-injection of treated water, the Texas Underground Injection Control, 30 TAC 331, rules would apply. The applicable location-specific ARARs concern CERCLA, which exempts Superfund sites from permitting requirements, but requires that the substantive requirements of regulations be met. In addition, the Harris County rule which prohibits drilling of water wells in a contaminated plume designated by USEPA or TCEQ is a local ARAR. The Texas General Air Quality Rules, 30 TAC 101, and Subchapter X: Waste Processes and Remediation, 30 TAC 106.533, are applicable for the remedial actions that involve air emissions (i.e., water treatment by air stripping).

Five-Year Reviews: Because all alternatives will result in hazardous substances remaining on-Site above health-based concentration levels, a review will be conducted within five years of commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment. The **five year reviews** will continue no less often than every five years as long as the Site contains contamination above levels that allow use for unlimited and unrestricted exposure.

Operation and Maintenance: All alternatives except the No Further Action alternative include operation and maintenance activities and costs to continue operating and/or monitoring the remedy in the future. The present worth of the costs, which is shown for each alternative below, is estimated using a 7% discount factor. Present worth is the value in current dollars of these future costs. The future costs are discounted, or reduced, to reflect that future dollars are worth less than current dollars based on the earning capacity of money. For cost estimating purposes, the costs for all remedial alternatives, except the No Further Action alternative, assume a 30-year operational timeframe.

Remedial Alternatives

Alternative 1: No Further Action
Estimated Implementation Time: 0 months
Estimated Capital Cost: $0
Estimated Annual O&M Costs: $0
Estimated Present Worth (7%): $0

The NCP, 40 C.F.R. § 300.430(e)(6) requires that the "no action" alternative be evaluated at every site to establish a baseline for comparison. Under this alternative, EPA would take no action at the Site to prevent exposure to the contaminants remaining at the Site.

Alternative 2: In-Situ Treatment
Estimated Implementation Time: 6 to 12 months
Estimated Capital Cost: $1,860,160
Estimated O&M Costs: $2,022,510
Estimated Present Worth (7%): $2,810,279

The alternative would involve in-situ treatment of the soil and **groundwater**. A pilot study will be conducted during the Remedial Design to determine which in-situ treatment will be most effective and appropriate for the source area soil and **groundwater** and the deep **groundwater** plume. For cost estimating purposes, it is assumed that **in-situ chemical oxidation** (**ISCO**) will be chosen for source area **groundwater** and **bioaugmentation** will be chosen for the deep **groundwater** plume. **ISCO** is a technology that oxidizes contaminants dissolved in the soil or ground water, converting them into insoluble compounds. The reaction occurs underground within the contaminated area. **Bioaugmentation** is the introduction of microorganisms and other materials to treat contaminated soil or water.

Chemical oxidant would be injected through approximately 144 temporary injection sites to 50 feet bgs, spaced 20 feet apart in the Cypress Shopping Center parking lot as shown on Figure 6. It is anticipated that two applications of permanganate would be made to the shallow soils and **groundwater**. Injections would be made from the outside in and from the bottom up to minimize horizontal and vertical induced migration caused by fluid displacement. **Bioaugmentation** would be applied to hot spots within the deeper zones of **groundwater** to both destroy contaminants and enhance **natural attenuation** of contaminants. The 10 most contaminated of these water wells would have **bioaugmentation** applied. Contingent upon an evaluation of water well conditions and specifications, **bioaugmentation** would be applied through existing inactive water wells with the permission of the well owner. Further applications of **bioaugmentation** (both in timing and choice of wells) would depend on the results of ongoing monitoring results. It is anticipated that four applications of **bioaugmentation** would be applied to the 10 most contaminated water wells, with at least one year between applications. This alternative will not meet the RAO for containment because it does not control plume migration.

The remedy will be reviewed every 5 years to ensure its effectiveness.

Alternative 3: Hydraulic Containment/Pump and Treat
Estimated Implementation Time: 6 to 12 months
Estimated Capital Cost: $2,962,540
Estimated O&M Costs: $3,776,310
Estimated Present Worth (7%): $4,768,271

This alternative would involve pumping **groundwater** from both the source area (less than 50 feet bgs) and the deeper **groundwater** zones at rates sufficient to prevent further migration of PCE in **groundwater**. The exact number and location of the extraction wells, as well as the treatment plant location, will be determined during the Remedial Design. Based on the *Simple Capture Zone Modeling* conducted for the **FS**, pumping rates to hydraulically contain the deep **groundwater** plumes are approximately 120 gallons per minute total from multiple pumping wells. Pumping rates for the source area **groundwater** zone will depend upon hydraulic properties to be determined during the Remedial Design. **Groundwater** extracted from the wells would be treated by air stripping to remove PCE contamination and the air waste stream would be run through granulated activated carbon (GAC) for polishing if necessary to prevent public exposure to PCE by inhalation. For the purpose of estimating costs, treated **groundwater** would be reinjected into the WBUs to offset potential subsidence.

The remedy will be inspected annually and reviewed every 5 years to ensure its effectiveness.

Alternative 4: In-Situ Enhancements to Pump and Treat (Preferred Alternative)
Estimated Implementation Time: 6 - 12 months
Estimated Capital Cost: $4,223,020

Estimated O&M Costs: $3,776,310
Estimated Present Worth (7%): $5,949,352

Under this alternative, in-situ treatment of soil and **groundwater** would be used in addition to pumping **groundwater** from both the source area (less than 50 feet bgs) and the deeper **groundwater** zones to prevent further migration of PCE in **groundwater**. **ISCO** would be applied to soil and shallow **groundwater** in the source area to destroy source area contaminants. This activity would be performed as described in Alternative 2. **Bioaugmentation** would be applied to the deeper zones of **groundwater** with lower PCE concentrations to both destroy contaminants and enhance **natural attenuation** of contaminants. This activity would be performed as described in Alternative 2. Pumping of groundwater for hydraulic control and treatment would be performed as described in Alternative 3, with exceptions made for periods of in-situ treatment application to allow time for the applied treatments to effectively destroy contaminants. It is anticipated that hydraulic containment/pump and treat of the source area shallow **groundwater** (less than 50 feet bgs) will be unnecessary after **ISCO** application to the area.

The remedy will be reviewed every 5 years to ensure its effectiveness.

EVALUATION OF ALTERNATIVES

The NCP requires that the alternatives be evaluated against nine evaluation criteria. This section summarizes the relative performance of the alternatives by highlighting the key differences among the alternatives in relation to the nine criteria. These nine criteria are categorized into three groups: threshold, balancing, and modifying. The threshold criteria of overall protection of human health and environment and compliance with **ARARs** must be met in order for an alternative to be eligible for selection. The balancing criteria of long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, and cost are used to weigh major tradeoffs among alternatives. The modifying criteria of State and community acceptance are taken into account after State and public comment is received on EPA's preferred alternative as identified and described in the Proposed Plan of Action. The Detailed Analysis of Alternatives can be found in the **Feasibility Study**.

1. **Overall Protection of Human Health and the Environment** *determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through **institutional controls**, engineering controls, or treatment.*

With the exception of the No Action alternative, and Alternative 2, which does not control plume migration, the proposed remedial actions can meet the **RAOs** and are protective of human health and the environment. Alternatives 2 and 4 provide a greater level of overall protection since source material in the shallow **aquifer** and hot spots in the deep **aquifer** are treated using in-situ technologies. Alternative 3 offers less protection because there is no in-situ treatment of source areas or **groundwater**. Alternative 4 is more protective than Alternatives 2 and 3 since in-situ treatment is used to remediate the source area and **groundwater** and pump and treat wells are used to prevent further migration of the **groundwater** plume to potential downgradient receptors.

All of the alternatives rely on **ICs** to prevent the installation of **groundwater** wells for a source of drinking water.

2. **Compliance with Applicable, Relevant and Appropriate Requirements (ARARs)** *evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the Site or whether a waiver is justified.*

Compliance with **ARARs** is a threshold criterion and must be met in order for the alternative to be eligible for selection as a remedial action. In certain circumstances, an **ARAR** waiver may be granted in lieu of compliance. Alternative 1 (No Further Action) does not meet this threshold; without some type of treatment in the former source area and deeper plume, significant decreases in the contaminant concentrations are unlikely to occur within a reasonable time frame. All other alternatives meet this minimum.

Alternative 2 complies with **ARARs** by destroying contaminants in-situ by chemical oxidation or biodegradation to reduce concentrations to levels below the **MCLs**. Alternative 3 complies with **ARARs** by removing contaminants from the groundwater with a hydraulic containment/pump and treat system to reduce concentrations to levels below the **MCLs**. Alternative 4 complies with **ARARs** by destroying contaminants in situ and removing contaminants from groundwater with a hydraulic containment/pump and treat system to reduce concentrations to levels below **MCLs**.

3. **Long-term Effectiveness and Permanence** *considers the ability of an alternative to maintain reliable protection of human health and the environment over time.*

Alternatives 2 and 4 utilize in-situ treatment to address the source area associated with the former dry cleaning operations. These alternatives offer a greater level of long-term effectiveness and permanence than Alternative 3 since source material, which could continue to contribute to the dissolved phase **groundwater** contamination, is treated. However, Alternative 2 does not control plume migration. Alternative 3 is effective in the long-term since pumping and treatment of **groundwater** would prevent the plume from migrating to potential downgradient receptors. Alternative 4 offers the greatest long-term effectiveness and permanence since in-situ treatments will reduce or remove contaminants in the source area soils and **groundwater** plumes while preventing the **groundwater** plume from moving towards potential downgradient receptors.

4. **Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment** *evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.*

All of the alternatives would reduce the toxicity, mobility or volume of the contaminants through in-situ treatment and/or pumping and treating of contaminated **groundwater**. Alternatives 3 and 4 result in a greater reduction of mobility since **groundwater** is pumped and treated which would limit the ability of the **groundwater** contaminants to move further downgradient. Alternatives 2 and 4 reduce the toxicity of contaminants in a shorter time period since the in-situ treatments of **groundwater** actually destroy the contaminants. Alternative 4 offers the greatest reduction of toxicity, mobility or volume through treatment since in-situ treatment destroys the contaminants in the **groundwater**, and the pumping and treating of **groundwater** reduces the volume and mobility of contaminants.

5. **Short-term Effectiveness** *considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.*

In-situ treatment which is included in Alternatives 2 and 4 would be effective in the short term because chemical oxidation reaction rates are fast. It is expected that the **bioaugmentation** treatments will reduce contaminants at a slower rate, but with greater potential for continuing reductions over the longer term. The short term risks associated with in-situ treatment application should be manageable with a well implemented Site health and safety plan. Alternatives 2 and 4 would take longer to implement in the short –term since **ISCO** and **bioaugmentation** treatments would take place over a four year time frame. Alternative 3 would take the shortest amount of time to implement since no in-situ treatments are used. Workers will face potential exposure to contaminated media during construction, operation, and maintenance. Compliance with a Site-specific health and safety plan will mitigate these risks. Wastes produced by Alternatives 3 and 4 will include contaminated drill cuttings, contaminated water from well development and decontamination, and spent treatment media.

Considering the relative time required to achieve the **RAOs**, Alternative 4 (in-situ treatment plus pump and treat) has the shortest expected time because contaminants would be destroyed in-situ or removed by the hydraulic containment/pump and treat system. Alternative 2 (in-situ treatment) would rank next because it employs in-situ destruction of contaminants, but has no ongoing hydraulic containment/pump and treat aspect to address contaminants from beyond the reach of the in-situ treatment application. These contaminants outside the reach of the in-situ treatments would be addressed by monitored **natural attenuation** alone, which is expected to require a longer time period because contaminants are not being physically removed. Finally, Alternative 3 (pump and treat) is expected to require slightly more time than Alternative 2 to achieve the **RAOs** because the lack of in-situ contaminant destruction would leave more contaminants in the **groundwater** at any comparable future time.

6. **Implementability** *considers the technical and administrative feasibility of implementing the alternative, such as relative availability of goods and services.*

ISCO and **bioaugmentation** (components of Alternatives 2 and 4) are commercially available technologies that have been used at numerous contaminated soil and **groundwater** sites for the same chlorinated solvents. Before **ISCO** or **bioaugmentation** injection can begin, a pilot study will have to be conducted to determine the injection radius of influence and quantity of amendments necessary to degrade the contaminants. The results of the pilot study could impact the number and spacing of injection locations in the source area. Prior to beginning **bioaugmentation** in the deeper **groundwater**, well owners would have to grant access and permission to use existing wells. If existing wells cannot be used, new injection wells will have to be drilled. Hydraulic containment/pump (components of Alternatives 3 and 4) and treat would require administrative coordination to maintain permission to install extraction wells, injection wells, piping, and treatment plants. Significant labor, equipment and materials would be required for installing the systems. **Groundwater** extraction and air stripping are well developed technologies and commercially available.

7. **Cost** *includes estimated capital and operation and maintenance costs as well as present worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.*

No costs are associated with Alternative 1. Alternative 2 has a total capital cost of $1,860,160 and O&M costs of $2,022,510 at a present value of $2,810,279. Alternative 3 has a total capital cost of $2,962,540 and O&M costs of $3,776,310 at a present value of $4,768,271. Alternative 4 has a total capital cost of $4,223,020 and O&M costs of $3,776,310 at a present value of $5,949,352.

8. **State/Support Agency Acceptance** *considers whether the State agrees with U.S. EPA's analysis and recommendations of the **RI/FS** and the Proposed Plan.*

The State of Texas supports the Preferred Alternative without comment.

9. **Community Acceptance** *considers whether the local community agrees with U.S. EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.*

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Record of Decision for the Site.

SUMMARY OF THE PREFERRED ALTERNATIVE

Based on the preceding comparison, EPA proposes Alternative 4 as the Preferred Alternative to address the **remedial action objectives** of source control, plume containment, and **aquifer** restoration. Under Alternative 4, in-situ treatment of soil and **groundwater** would be used in addition to pumping **groundwater** from both the source area (less than 50 feet bgs) and the deeper **groundwater** zones to prevent further migration of PCE in **groundwater**. **ISCO** would be applied to soil and shallow **groundwater** in the source area to destroy source area contaminants. **Bioaugmentation** would be applied to the deeper zones of **groundwater** with lower PCE concentrations to both destroy contaminants and enhance **natural attenuation** of contaminants. Pumping of groundwater for hydraulic control and treatment would be performed with exceptions made for periods of in-situ treatment application to allow time for the applied treatments to effectively destroy contaminants. It is anticipated that hydraulic containment/pump and treat of the source area shallow **groundwater** (less than 50 feet bgs) will be unnecessary after **ISCO** application to the area. The preferred alternative also includes the implementation of **ICs** as described above.

The Preferred Alternative represents an aggressive strategy to expedite contaminant removal through in-situ treatment of source area material, shallow **groundwater** and deep **groundwater;** and ground water extraction and treatment of deep **groundwater;** and shallow **groundwater** extraction and treatment for the short term. The proposed remedy is protective of human health and the environment, complies with Federal and State requirements that are legally **applicable or relevant and appropriate** to the remedial action, and is cost effective. The proposed remedy uses permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the statutory preference for remedies that use treatment that reduces toxicity, mobility, or volume as a principal element.

Of the five balancing criteria, reduction of toxicity, mobility or volume through treatment, long-term effectiveness, and cost are the criteria that influenced the Agency's proposal of Alternative 4 as the preferred remedial alternative. Alternative 4 offers the greatest reduction of toxicity, mobility or volume through treatment since in-situ treatment destroys the contaminants in the **groundwater**, and the pumping and treating of **groundwater** reduces the volume and mobility of contaminants. Alternative 4 offers the greatest long-term effectiveness and permanence since in-situ treatments will reduce or remove contaminants in the source area soils and **groundwater** plumes while preventing the **groundwater** plume from moving towards potential downgradient receptors. The cost difference between the preferred alternative and Alternatives 2 and 3 is between $3,139,073 and $1,181,081, respectively.

Because the remedy will result in hazardous substances remaining on-Site above health-based concentration levels, a review will be conducted within five years of commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment. The **five year reviews** will continue no less often than every five years as long as the Site contains contamination above levels that allow use for unlimited and unrestricted exposure.

The community will be informed that the **five-year review** will be conducted and when the **five-year review** is completed. The five-year review is a regular EPA checkup on a Superfund site that has been cleaned up, with waste left behind, to make sure the site is still safe, to make sure the cleanup continues to protect people and the environment, and to provide a chance for you to tell EPA about Site conditions and any concerns you have.

Based on information currently available, the EPA and TCEQ believe the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The EPA and TCEQ expect the Preferred Alternative to satisfy the following statutory requirements of **CERCLA** §121(b): 1) be protective of human health and the environment; 2) comply with **ARARs** (or justify a waiver); 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element (or justify not meeting the preference).

Glossary

Administrative Record – All documents which the EPA considered or relied upon in selecting the response action at a Superfund site, culminating in the Record of Decision for a Remedial Action.

Aquifer - An underground geological formation, or group of formations, containing water. Are sources of groundwater for wells and springs.

Applicable, or Relevant, and Appropriate Requirements (ARARs) – Generally, any Federal, State, or local requirements or regulations that would apply to a remedial action if it were not being conducted under CERCLA, or that while not strictly applicable, are relevant in the sense that they regulate similar situations or actions and are appropriate to be followed in implementing a particular remedial action.

Baseline Risk Assessment – A formal risk assessment conducted as part of the **RI** according to EPA-prescribed procedures. It is a qualitative and quantitative evaluation of the risk posed to human health and the environment by the presence and/or use of specific pollutants. The need for remedial action at a site is established in part on the results of the baseline risk assessment.

Bioaugmentation - The introduction of microorganisms and other materials to treat contaminated soil or water.

Carcinogen - Any substance that can cause or aggravate cancer.

Chemical of Concern (COC) - Those chemicals that are identified as a potential threat to human health or the environment, are evaluated further in the baseline risk assessment, and are identified in the **RI/FS** as needing to be addressed by the response action proposed in the ROD.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) – Also known as Superfund. CERCLA is a Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. Under CERCLA, the EPA can either pay for the site cleanup or take legal action to force parties responsible for site contamination to clean up the site or pay back the Federal government for the cost of the cleanup.

Feasibility Study (FS) – A detailed evaluation of alternatives for cleaning up a site.

Five-Year Reviews – A review generally required by statute or program policy when hazardous substances remain at a site above levels which permit unrestricted use and unlimited exposure. Five-year reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment. Reviews are performed five years after completion of the remedy construction at Superfund-financed sites, and are repeated every succeeding five years so long as future uses at a site remain restricted.

Groundwater – Water found beneath the ground surface that fills pores between soil, sand, and gravel particles to the point of saturation. When it occurs in a sufficient quantity and quality, ground water can be used as a water supply.

Hazard Index (HI) – In the **baseline risk assessment**, ratio of the dose calculated for a receptor divided by the **reference dose**. When the HI exceeds 1.0, a health risk is assumed to exist.

In-Situ Chemical Oxidation (ISCO) - Technology that oxidizes contaminants dissolved in the soil or ground water, converting them into insoluble compounds. The reaction occurs underground within the contaminated area.

Institutional Controls (ICs) – Non-engineered instruments, such as administrative and/or legal controls, that help to minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. **ICs** work by limiting land or ground water use and/or providing information that helps modify or guide a person's action at a site. Some common examples include restrictive covenants, deed notices, or local ordinances.

Maximum Contaminant Level (MCL) – MCLs are established under the Safe Drinking Water Act and are protective levels set for human exposure to a chemical in a drinking water source.

Micrograms per Liter (µg/L) – Equivalent to parts per billion (ppb); is a measurement of concentration used to measure how many micrograms of a contaminant are present in one liter of water. One µg/L is equal to 0.001 milligrams per liter (mg/L). One µg/L of PCE in water is like measuring one ounce of PCE in a billion ounces of water.

Milligrams per Liter (mg/L) – Equivalent to parts per million (ppm); is a measurement of concentration used to measure how many milligrams of a contaminant are present in one liter of water. One mg/L is equal to 1000 micrograms per liter (µg/L).

Natural Attenuation - Includes a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the amount, toxicity, or mobility of contaminants in soil or groundwater. Natural attenuation may include biodegradation, dispersion, dilution, sorption, volatilization, radioactive decay; and chemical or biological processes.

Operable Unit (OU) - An operable unit is a discrete action that comprises an incremental step toward comprehensively addressing site contamination.

National Priorities List (NPL) – EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response.

Plume - A measurable discharge of a contaminant from a given point of origin.

Principal Threat Wastes - Those materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The ERA expects to use treatment when practical to address the principal threats posed by a site. The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to ground water, surface water, or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, organic liquids in a separate phase (e.g., LNAPL) may be viewed as source material.

Reasonable Maximum Exposure (RME) – The maximum exposure reasonably expected to occur in a population.

Record of Decision - A public document that explains which cleanup alternative(s) will be used at Superfund (National Priorities List) sites.

Reference Dose (RfD) - An estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of detrimental effects during a lifetime.

Remedial Action Objectives (RAO) - RAOs provide a general description of what the cleanup will accomplish (e.g., restoration of ground water to drinking water levels). These goals typically serve as the design basis for the remedial alternatives for a site.

Remedial Design - A phase of remedial action that follows the remedial investigation/feasibility study and includes development of engineering drawings and specifications for a site cleanup.

Remedial Investigation (RI) – The collection and assessment of data to determine the nature and extent of contamination at a site.

Systemic Toxicant - A systemic toxicant is one that affects the entire body or many organs rather than a specific part of the body.

Figure 1 - Site Map

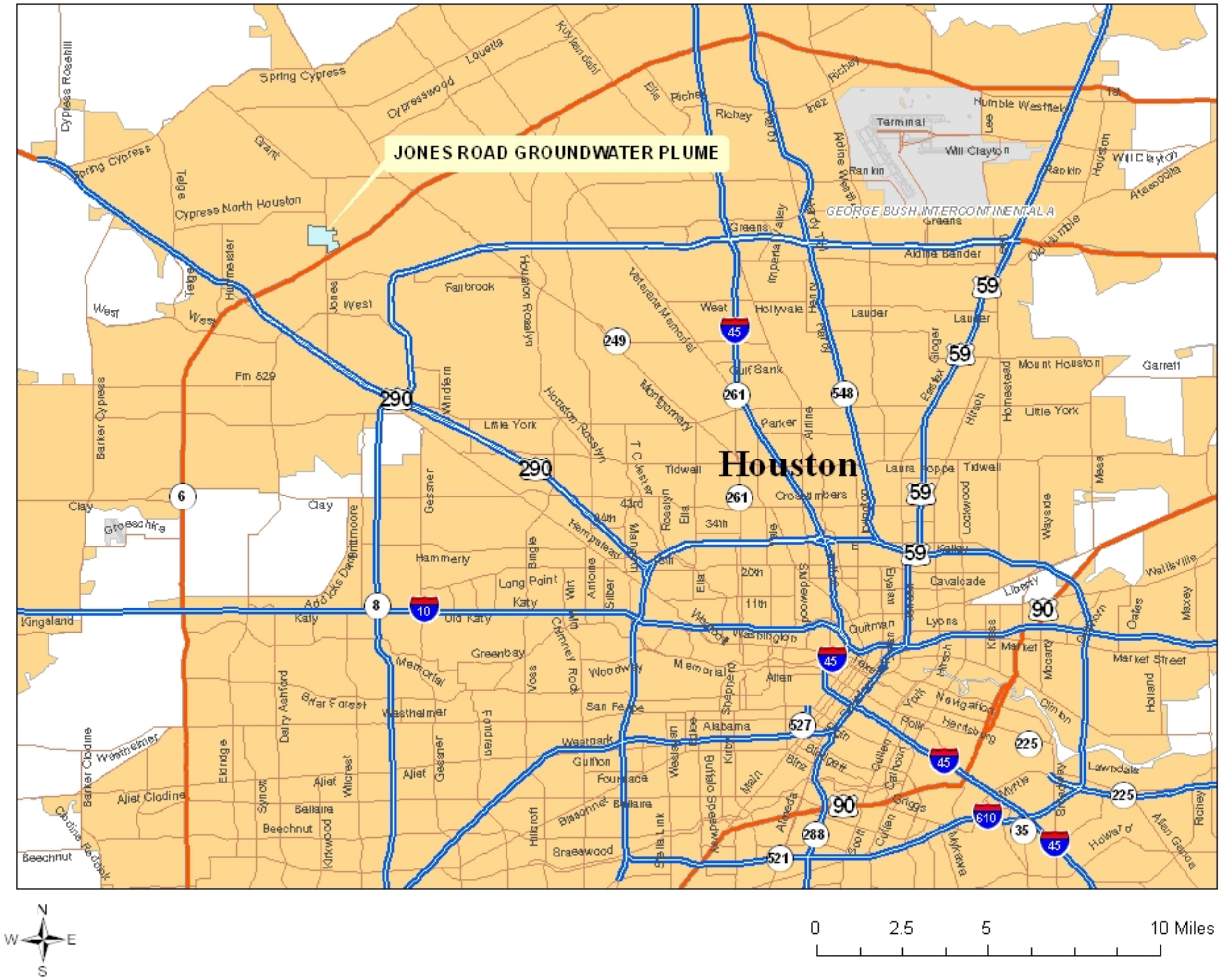

Figure 2 – Private Well Locations
Jones Road Superfund Site, Houston, Texas

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Figure 3 - Illustration of the Conceptual Site Model
Jones Road Groundwater Plume Superfund Site, Houston, Texas

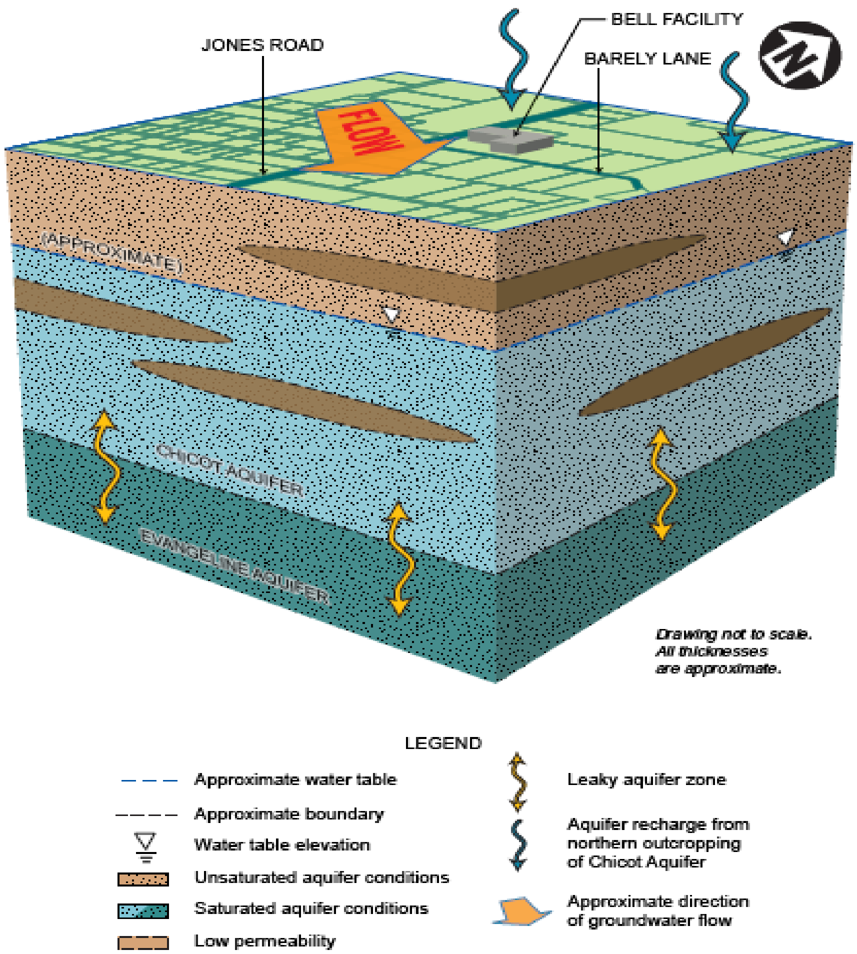

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Figure 4 - Areal Extent of Shallow Groundwater Contamination

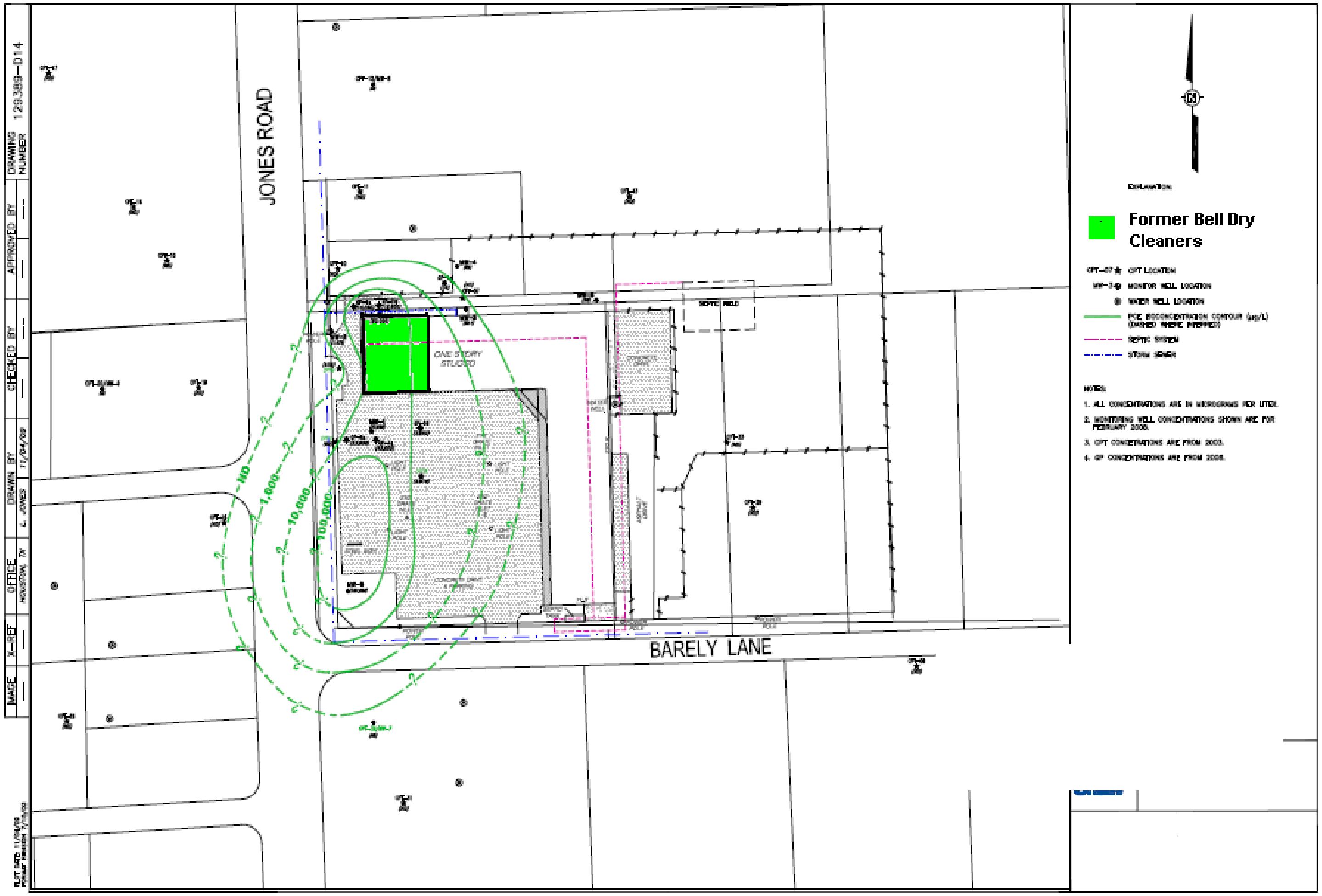

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Figure 5 - Areal Extent of Groundwater Contamination in the Deeper Zone

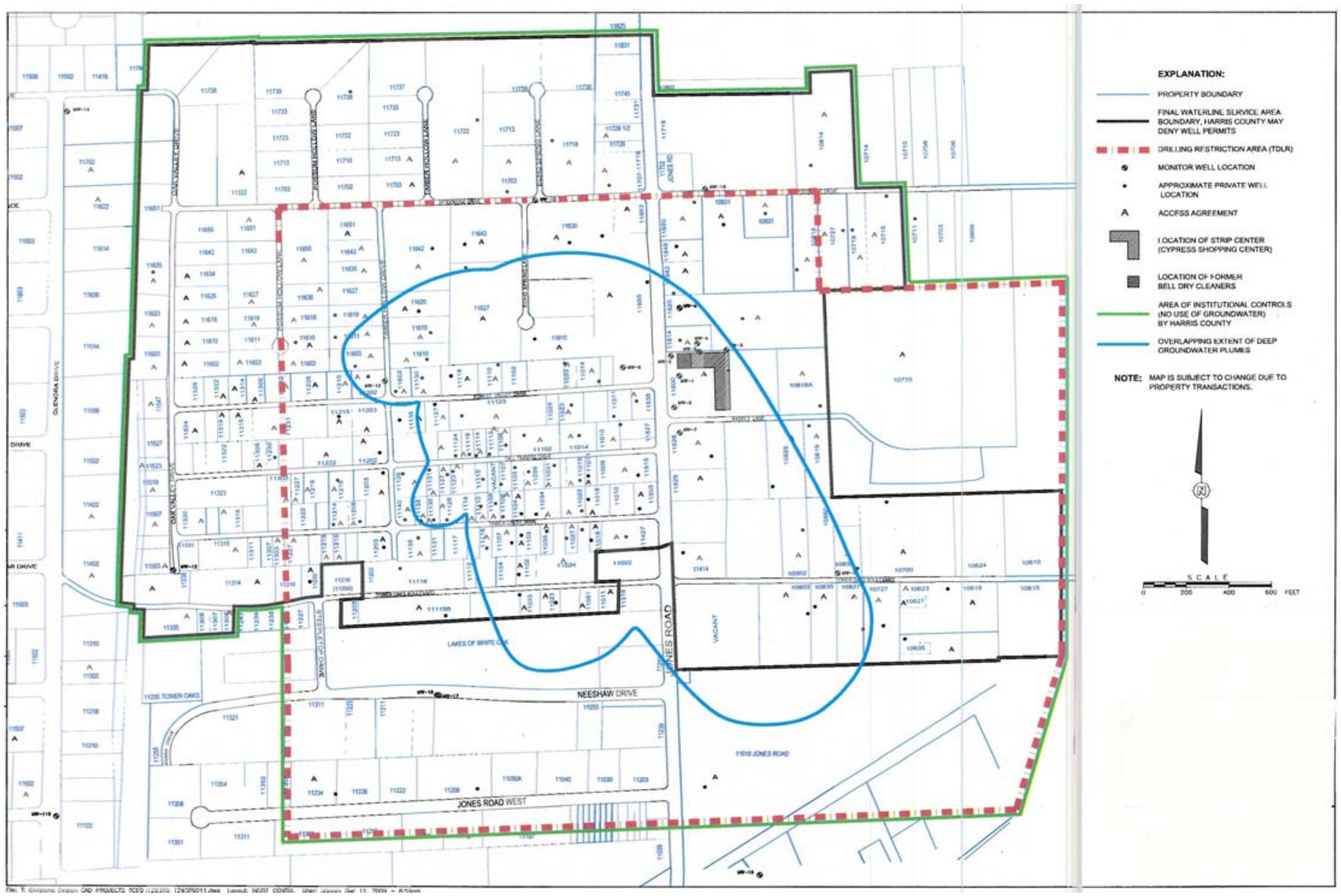

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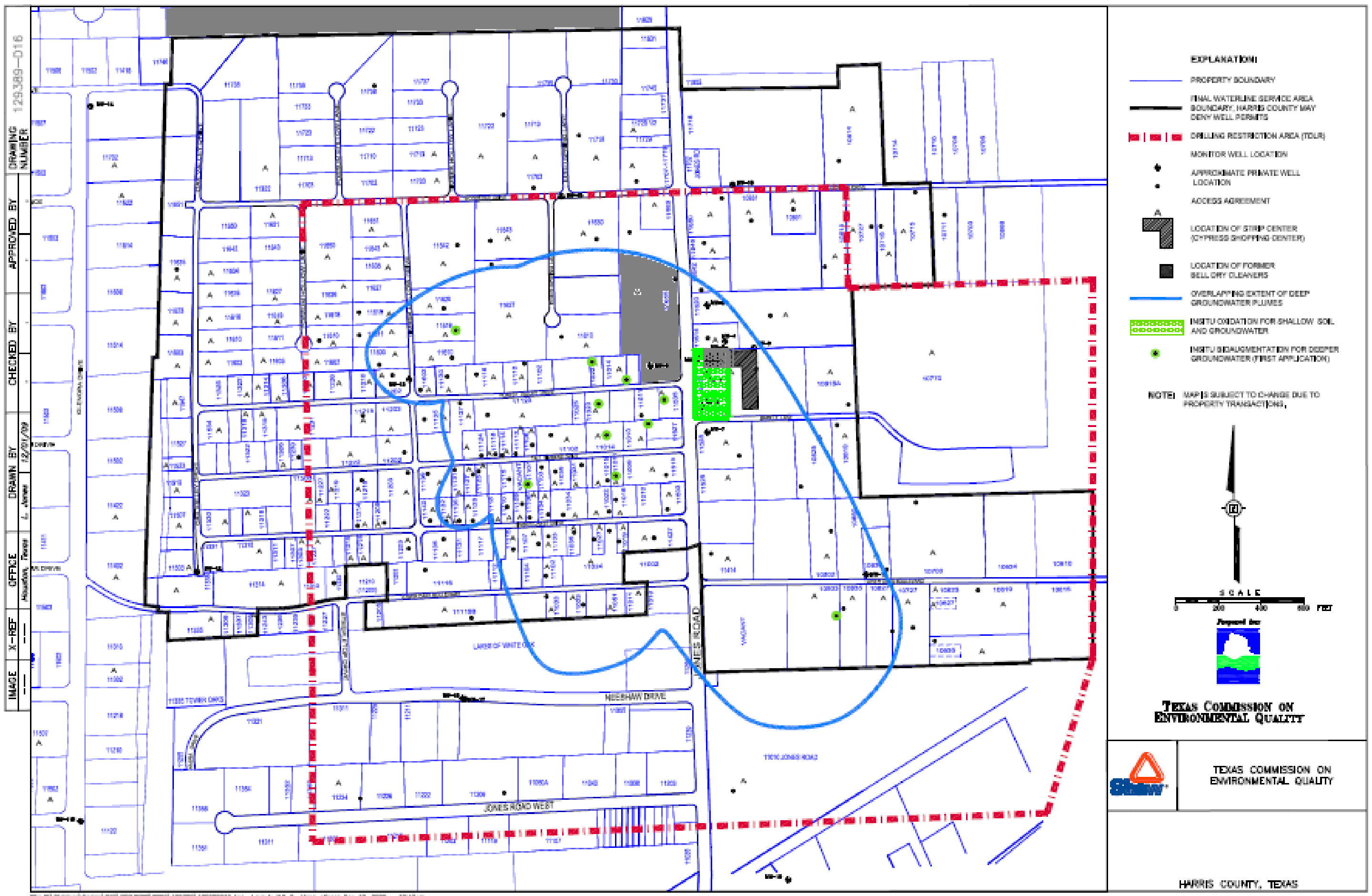
Figure 6 – In-Situ Enhancements to Pump & Treat



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Proposed Plan of Action

Jones Road Ground Water Plume Superfund Site

U.S. Environmental Protection Agency
Region 6 (6SF-VO)
1445 Ross Avenue
Dallas, Texas 75202-2733

YOUR INPUT IS AN IMPORTANT PART OF THE DECISION-MAKING PROCESS FOR THE JONES ROAD GROUND WATER PLUME SUPERFUND SITE

Your comments on the Proposed Plan for the Jones Road Ground Water Plume Superfund Site are important to the EPA and the TCEQ and will help us select a final cleanup remedy for the Site. Please use the space below to write your comments about EPA's recommended plan for the Jones Road Ground Water Plume Superfund Site. Your comments must be postmarked by June 28, 2010, at the end of the public comment period. Mail your comments to:

Donn Walters
U.S. EPA (6SF-VO)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Use additional sheets if necessary. You may also provide oral or written comments during the scheduled public meeting announced in this Proposed Plan. If you have any questions about the comment period or the Site, please contact Gary Baumgarten at (214) 665-6749 or through the EPA's toll-free number at 1-800-533-3508. Those with computer communication capabilities may submit their comments to the EPA via the Internet at the following e-mail address: "baumgarten.gary@epa.gov" (without the quotation marks). The EPA will respond to all significant comments in a "Responsiveness Summary" included with the Record of Decision for the Site.

Name: ______________________________

Address: ______________________________

City: ______________ State: ________ Zip Code: ________